WEST INDIAN HURRICANES OF AUGUST, 1928

By R. HANSON WEIGHTMAN

August 3–12, 1928.—From reports received by mail it is evident that a tropical disturbance, the first of the season, passed on a westward course some 75 to 100 miles north of the Leeward Islands during the 3d and 4th of August. (See fig. 1, track 1.) The first telegraphic report of its existence was received from the S. S. *Sixaola*, just west of Acklin Island on the afternoon of the 5th. The center moved northwestward with slowly increasing intensity and was central on the morning of the 6th about 60 miles southeast of Andros Island, Bahamas. At that time storm warnings were ordered for the southeast Florida coast between Key West and West Palm Beach. On the evening of that date storm warnings were lowered at Key West and extended northward to Titusville and caution advised for vessels off the east Florida coast north of Miami.

In the next 24 hours the center had advanced to a position about 70 miles east of Miami. Storm warnings were continued from Miami to Titusville and information was disseminated that a disturbance of considerable intensity was moving north-northwest with some indication of a recurve to the northward, caution being repeated to vessels between north-northwest and north-northeast of center. During the afternoon of that day the center had a more northern tendency as evidenced by special reports from vessels near the coast between Miami and Fort Pierce, and at 3:25 p. m. of that date a bulletin was issued stating that the storm was of hurricane intensity and apparently moving northward, and caution was advised for vessels off the South Atlantic coast south of Hatteras.

On the evening of the 7th no land observations were available between Titusville and Miami, but vessel reports south of the center indicated that it was beginning to turn north-northwest or possibly northwest. Accordingly, storm warnings were changed to hurricane warnings between Jupiter and Daytona, with advices that destructive north winds would occur early that night in the vicinity of Jupiter and that they would advance northward along the coast reaching the vicinity of Daytona by Wednesday morning, and that every precaution should be taken. At that time the center was about 20 miles southeast of Jupiter. By the morning of the 8th the center was about 60 miles northwest of Jupiter, moving northwest and emergency warnings for dangerous gales and heavy rains were issued for the interior of Florida Peninsula, north of latitude 28°. Northwest storm warnings were also ordered at Tampa and northeast storm warnings north of Tampa to Apalachicola, accompanied by the information that the disturbance, still of great intensity, was moving northwest and would cause strong northwest winds that afternoon in the Tampa region and northeast gales north of Tampa to Apalachicola during the afternoon and night; also, that high tides were indicated for Tampa Bay late that night or Thursday forenoon.

The storm continued to move northwestward with decreasing intensity to between Tampa and Apalachicola by the evening of the 9th. It then turned northward to southern Georgia bearing more and more to the northeastward until it finally passed off the coast north of the Virginia Capes during the night of the 11th.

The lowest barometer reported was 28.70 inches by the S. S. *Lempira* about 30 miles southeast of Jupiter, Fla., at 7 p. m. of the 7th. The center passed nearly over Fort Pierce as a lull was experienced between 3 and 4 a. m. of the 8th.

Observations from Fort Pierce, Fla., August 7 and 8, 1928, follow:

Time	Barometer	Wind
August 7:		
6:30 p. m.	29.78	NE.
7:30	29.76	NE.
9:00	29.70	NE.
10:00	29.66	NE.
11:20	29.52	NE.
11:45	29.48	NE.
August 8:		
12:30 a. m.	29.41	NE.
1:00	29.34	NE.
1:15	29.30	NE.
1:30	29.22	NE.
1:45	29.16	NE.
2:00	29.10	NE.
2:15	29.06	NE.
2:30	29.02	NE.
2:50	28.94	NE.
3:00		N. by E., commenced to lull and work around toward E.
3:15	28.90	
3:30	28.88	
3:45	28.85	Wind lulled; shifted by way of E. and SE.
4:00	28.84	
4:15	28.84	
4:30	28.90	SW. (estimated 90 m. p. h.).
4:45	29.00	
5:00	29.10	
5:15	29.16	
5:45	29.26	
6:00	29.30	

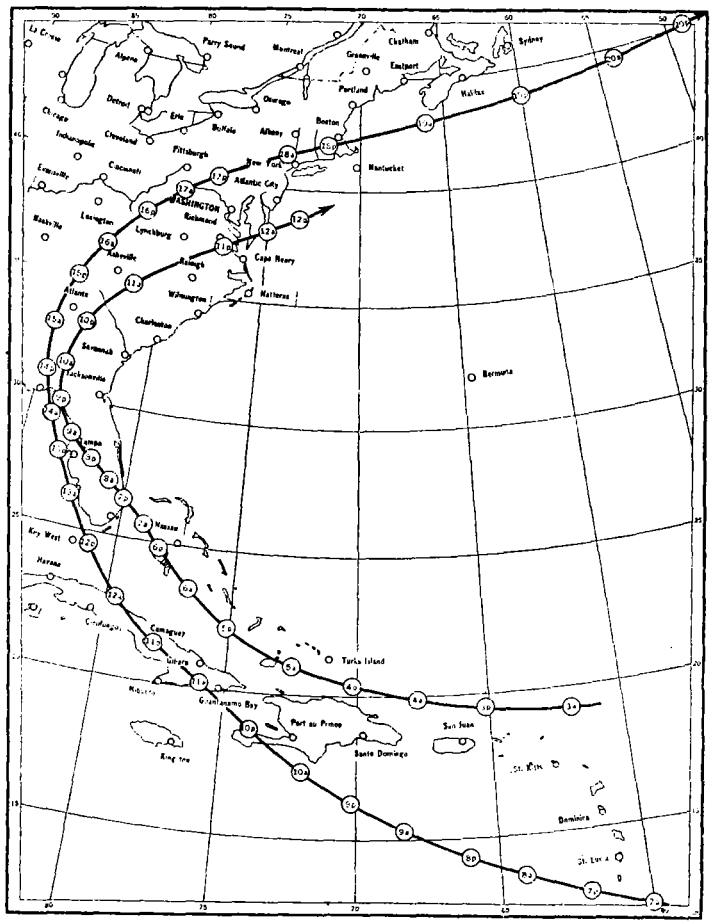

FIG. 1.—Storm tracks of the hurricanes of August 3–12 and 7–21, 1928

Damage (August 3–12, 1928).—The greatest damage occurred along and to the north and northeast of the portion of the track between Jupiter and the Georgia-Florida State line.

Citrus fruits.—Most of the damage was to citrus fruits, estimated by the State Citrus Exchange at 1,000,000 boxes.

Telephone and telegraph.—Considerable damage was done to telephone and telegraph equipment, to the extent of many thousand dollars, specific figures not being available.

Highways.—Highways suffered from the south-central east coast where the storm approached the coast, thence northwestward to point of exit. Minimum of $100,000 estimated by Florida State Highway Commission.

Bridges.—Washing rains damaged roadways and bridges, demoralizing schedules for several days.

Trees.—Many trees were uprooted in Osceola, Brevard, Orange and Marion counties.

Buildings and houses.—The following counties reported damage in connection with houses and buildings: Marion, Brevard, Osceola, and St. Lucie. Reports are still incomplete as to damage.

Storm of August 7–21, 1928.—The disturbance was first noted as one of slight to moderate intensity west of Bridgetown, Barbados, on the evening of the 7th, advancing west-northwest. (See fig. 1, track 2.)

On the evening of the 8th, the following was issued:

Tropical disturbance central about 150 miles south-southwest of Porto Rico moving northwest or west-northwest, of moderate intensity. Caution advised Santo Domingo, Haiti, Jamaica, and contiguous waters next 24 hours. Disturbance is apparently heading for southern Haiti coast.

The following was issued on the morning of the 9th:

Tropical disturbance probably of moderate intensity, 75 to 100 miles south of Santo Domingo coast, moving northwest. Caution advised against; strong northeast and east winds this afternoon and to-night, Santo Domingo and Haiti, and to-night in Windward Passage. Caution also advised Jamaica and eastern Cuban waters to-night.

The next direct information was given by a special report from the S. S. *J. A. Moffett*, taken at 9 a. m., the 9th, in latitude 15½°, longitude 69°, barometer 29.46, westward 48 miles; later an 11 a. m. observation showed wind shifting to south. Accordingly, special advices were sent to Haiti and Jamaica as follows:

Disturbance of considerable intensity moving apparently west-northwest. Extreme caution advised Jamaica and southern Haiti.

Belated reports indicate that a very small but destructive disturbance passed over extreme southwest Haiti during the 10th.

On the morning of the 11th the center of the disturbance was over extreme eastern Cuba, the U. S. S. *Arkansas* in Guantanamo Bay having reported an east wind of 78 m. p. h. at 4:30 a. m. of that date.

As far as telegraphic reports are concerned, the center was not definitely traceable for the next 24 to 36 hours, but reports received by mail indicate that a small center passed over the province of Oriente, Cuba, where some banana trees were blown down, and was central on the morning of the 12th on the north coast of central Cuba. Observations during the afternoon of the 12th indicated a disturbance southeast of Key West, and an advisory was sent to southern Florida stations. At 8 p. m. of that date it was evident that a small but intense disturbance was advancing northwestward toward the Florida Keys and advices were disseminated for gales over this region, possibly reaching hurricane force near the center. Storm warnings were ordered from West Palm Beach on the east coast southward to Key West and thence northward along the west coast to Punta Russa and Punta Gorda. On the 13th storm warnings were extended north and west to Mobile. The disturbance advanced on a north-northwest course just off the west coast of Florida and passed inland a short distance west of Cedar Keys, attended by gales in that region. Gales were also experienced along the coast and over the Florida Keys.

KANSAS TORNADOES, 1914–1928

By S. D. FLORA

[Weather Bureau Office, Topeka, Kans., November 13, 1928]

Beginning with 1914, special care has been taken to record important facts concerning each tornado that has occurred in Kansas. This has been largely possible through the network of more than 140 stations of the Weather Bureau in the State, representing conditions in every county. In addition, reports of tornadoes are furnished by weather correspondents of the bureau and by clippings from newspapers of the State. In practically all cases details concerning each storm have been gathered by questionnaires mailed observers and correspondents of the bureau, postmasters, and other responsible persons in or near the path of the storm.

While some areas of Kansas, especially in the western half, are rather thinly settled, it is believed that few, if any, tornadoes have appeared in the State during the time covered that are not given in the tabulation accompanying this article. Certainly none of consequence has escaped notice.

The total number tabulated for the 15-year period is 176, or an average of slightly less than 12 per year. In a number of instances the appearance of a number of funnel-shaped clouds at the same time or at different times in course of the progress of a storm has been considered as a single tornado.

The total number of deaths directly due to these tornadoes is 102 and the total property loss for which estimates are available is $9,547,150. As there are several rather damaging tornadoes for which no estimates are available, the actual property loss is probably a little in excess of $10,000,000, or approximately $700,000 annually. This does not include losses due to violent winds not of tornadic origin, which have been considerable.

Undoubtedly, Kansas is in what is known as the tornado belt of the country but it is interesting to note that it lies at the western edge of this belt. Of the 176 storms tabulated 45 per cent occurred in the eastern third of the State, 34 per cent in the middle third, and but 21 per cent in the western third.

There is no reason to think that Kansas is more infested with tornadoes than several other States. While statistics for the past 15 years are not available for comparison, the discussion of tornadoes in the 8-year period, 1916–1923 by Hunter, MONTHLY WEATHER REVIEW, May, 1925, showed during 25 years more tornadoes per unit area in Iowa than in Kansas and practically as many in Arkansas, Illinois, and Missouri.

Losses of lives and property during an 8-year period were much greater than in Kansas in Alabama, Illinois, Indiana, and Minnesota. This, of course, may be partly due to the greater density of population and buildings in states east of Kansas although the greater average length of paths of the eastern tornadoes probably has much to do with it.

Comparatively few Kansas tornadoes travel more than 40 miles. Of the 176 tabulated but 5 left paths of 50 miles or more in length. The longest was the violent storm that struck Hutchinson on May 7, 1927, which disappeared 118 miles from its point of origin, though